

SEQUENCE LISTING

5 <110> Eijiro WATANABE et al.; Sumitomo Chemical Company Limited

 <120> Raffinose Synthase Genes and Their Use

 <150> JP 10/120550

10 <151> 1998-04-30

 <150> JP 10/120551

 <151> 1998-04-30

15 <150> JP 10/345590

 <151> 1998-12-04

 <150> JP 10/351246

 <151> 1998-12-10

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 35 40 45

35 Gln His Tyr Ala Leu Pro Thr Arg Asp Cys Leu Phe Val Asp Pro Leu

 50 55 60

 His Asp Gly Lys Thr Met Leu Lys Ile Trp Asn Leu Asn Lys Cys Ser

 65 70 75 80

 Gly Val Leu Gly Leu Phe Asn Cys Gln Gly Gly Gly Trp Cys Pro Val

40 85 90 95

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	Phe Ala Ser Pro Gln Asp Ile Glu Trp Gly Lys Gly Lys His Pro Val	
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5	Cys Ile Lys Gly Val Asp Val Phe Ala Val Tyr Met Phe Lys Asp Asp	
	130 135 140	
	Lys Leu Lys Leu Leu Lys Tyr Thr Glu Ser Val Glu Val Ser Leu Glu	
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	Pro Phe Ser Cys Glu Leu Leu Thr Val Ser Pro Val Val Ile Leu Pro	
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	Arg Lys Ser Ile Gln Phe Ala Pro Ile Gly Leu Val Asn Met Leu Asn	
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	Ser Gly Gly Ser Ile Met Ser Leu Glu Phe Asp Gln Gln Glu Asn Leu	
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15	Ala Arg Ile Gly Val Arg Gly His Gly Glu Met Arg Val Phe Ala Ser	
	210 215 220	
	Glu Lys Pro Glu Ser Val Lys Ile Asp Gly Glu Ser Val Glu Phe Asp	
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	att tct ggt gga cca att tat gta agc gac tct gtt gga aaa cac aac	94
	Ile Ser Gly Gly Pro Ile Tyr Val Ser Asp Ser Val Gly Lys His Asn	
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40	ttc aag ttg ctt aag aag ctt gtt cta cct gat ggc tcc att ttg cgg	142

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	Cys	Gln	His	Tyr	Ala	Leu	Pro	Thr	Arg	Asp	Cys	Leu	Phe	Val	Asp	Pro	
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	Leu	His	Asp	Gly	Lys	Thr	Met	Leu	Lys	Ile	Trp	Asn	Leu	Asn	Lys	Cys	
			65				70					75					
	tcc	ggg	ggt	ttg	ggt	ctg	ttc	aat	tgc	caa	gga	gga	ggt	tgg	tgc	cct	286
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	Val	Thr	Arg	Arg	Asn	Lys	Ser	Ser	Ser	Asp	Tyr	Ser	His	Ser	Val	Thr	
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	Cys	Phe	Ala	Ser	Pro	Gln	Asp	Ile	Glu	Trp	Gly	Lys	Gly	Lys	His	Pro	
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	Val	Cys	Ile	Lys	Gly	Val	Asp	Val	Phe	Ala	Val	Tyr	Met	Phe	Lys	Asp	
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	Asp	Lys	Leu	Lys	Leu	Leu	Lys	Tyr	Thr	Glu	Ser	Val	Glu	Val	Ser	Leu	
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25	Glu	Pro	Phe	Ser	Cys	Glu	Leu	Leu	Thr	Val	Ser	Pro	Val	Val	Ile	Leu	
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	Pro	Arg	Lys	Ser	Ile	Gln	Phe	Ala	Pro	Ile	Gly	Leu	Val	Asn	Met	Leu	
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	Asn	Ser	Gly	Gly	Ser	Ile	Met	Ser	Leu	Glu	Phe	Asp	Gln	Gln	Glu	Asn	
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	Leu	Ala	Arg	Ile	Gly	Val	Arg	Gly	His	Gly	Glu	Met	Arg	Val	Phe	Ala	
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	Ser	Glu	Lys	Pro	Glu	Ser	Val	Lys	Ile	Asp	Gly	Glu	Ser	Val	Glu	Phe	
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	Ser Arg Leu Ser Val Val Glu Tyr Leu Phe							
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	Ser Asn Phe Met Val Asn Gly His Val Ile Leu Ser Gln Val Pro Ser							
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	Phe Asp Ala Pro Glu Pro Lys Ala Arg His Val Val Ser Val Gly Gln							
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	Leu Lys Gly Ile Pro Phe Met Ser Ile Phe Arg Phe Lys Val Trp Trp							
25		85		90		95		
	Thr Thr His Trp Thr Gly Ser Asn Gly Arg Asp Leu Glu His Glu Thr							
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	Gln Ile Leu Ile Leu Asp Lys Ser Asp Glu Gly Leu Gly Arg Pro Tyr							
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	Pro Gly Ser Val Asp Asp Tyr Val Asp Ile Cys Val Glu Ser Gly Ser							
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	Thr Lys Val Val Gly Asp Ser Phe Arg Ala Val Leu Tyr Ile Arg Ala							
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	Ala His Leu Gly Thr Phe Lys Leu Leu Asp Asp Lys Thr Pro Pro Gly							
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		Asp	Met	Phe															

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	Leu Arg Cys Glu Tyr His Ala Leu Pro Thr Lys Asp Cys Leu Phe Val					
5		565		570		575
	Asp Pro Leu His Asp Gly Lys Thr Met Leu Lys Ile Trp Asn Leu Asn					
		580		585		590
	Lys Tyr Asn Gly Val Leu Gly Val Phe Asn Cys Gln Gly Gly Gly Trp					
		595		600		605
10	Ser Arg Glu Ser Arg Lys Asn Leu Cys Phe Ser Glu Tyr Ser Lys Pro					
	610		615		620	
	Ile Ser Cys Lys Thr Ser Pro Lys Asp Val Glu Trp Glu Asn Gly His					
	625		630		635	640
	Lys Pro Phe Pro Ile Lys Gly Val Glu Cys Phe Ala Met Tyr Phe Thr					
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	Lys Glu Lys Lys Leu Ile Leu Ser Gln Leu Ser Asp Thr Ile Glu Ile					
		660		665		670
	Ser Leu Asp Pro Phe Asp Tyr Glu Leu Ile Val Val Ser Pro Met Thr					
	675		680		685	
20	Ile Leu Pro Trp Glu Ser Ile Ala Phe Ala Pro Ile Gly Leu Val Asn					
	690		695		700	
	Met Leu Asn Ala Gly Gly Ala Val Lys Ser Leu Asp Ile Ser Glu Asp					
	705		710		715	720
	Asn Glu Asp Lys Met Val Gln Val Gly Ile Lys Gly Ala Gly Glu Met					
25		725		730		735
	Met Val Tyr Ser Ser Glu Lys Pro Lys Ala Cys Arg Val Asn Gly Glu					
		740		745		750
	Asp Met Glu Phe Glu Tyr Glu Glu Ser Met Ile Lys Val Gln Val Thr					
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	gagttttttt agctcttatt tcctaagaaa ttaatagcaa aagttttgca taact atg	238
		Met
	gct cca agc ttt agc aag gaa aat tcc aag acg tgt gat gag gtt gca	286
	Ala Pro Ser Phe Ser Lys Glu Asn Ser Lys Thr Cys Asp Glu Val Ala	
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	Asn His Asp Asp Cys Asn Thr Cys Pro Ile Ile Ser Leu Glu Glu Ser	
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	Lys Gly Ile Pro Phe Met Ser Ile Phe Arg Phe Lys Val Trp Trp Thr	
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	acc cat tgg act ggg tcc aat ggg cgg gac ctt gag cat gag acc caa	574
	Thr His Trp Thr Gly Ser Asn Gly Arg Asp Leu Glu His Glu Thr Gln	
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	att ctc atc ctt gat aag tca gat gaa ggt ttg ggc cgt ccc tat att	622
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	Pro Asp Pro Phe Lys Leu Ile Lys Asp Thr Met Lys Glu Val Gln Ala	
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5	cat tta ggg act ttc aaa ctc tta gat gac aaa act cct cca gga ata	862
	His Leu Gly Thr Phe Lys Leu Leu Asp Asp Lys Thr Pro Pro Gly Ile	
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	Val Asp Lys Phe Gly Trp Cys Thr Trp Asp Ala Phe Tyr Leu Lys Val	
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	Glu Pro Tyr Gly Val Trp Glu Gly Val Lys Gly Leu Val Glu Asn Gly	
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	Val Pro Pro Gly Leu Val Leu Ile Asp Asp Gly Trp Gln Ser Ile Cys	
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	Ala Gly Glu Gln Met Pro Cys Arg Leu Ile Lys Tyr Glu Glu Asn Phe	
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	Pro Asn Met Gly Met Arg Ala Phe Val Arg Asp Leu Lys Glu Glu Phe	
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	aaa act gtt gag cat gtg tat gtt tgg cat gct ttt acg ggc tat tgg	1246
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	Ile Asp Gly Val Lys Val Asp Val Ile His Leu Leu Glu Met Met Ala	
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	gcc tac aat agc tta tgg atg gga aac ttt ata cac cct gac tgg gac	1774
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	Arg Cys Glu Tyr His Ala Leu Pro Thr Lys Asp Cys Leu Phe Val Asp	
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		35		40		45		
5		atc gac gac ggt tgg caa tcg att gga cat gac tcc gat ggt atc gat	192					
		Ile Asp Asp Gly Trp Gln Ser Ile Gly His Asp Ser Asp Gly Ile Asp						
		50		55		60		
		gtt gaa ggg atg agt tgt acc gtc gcc ggg gag caa atg cct tgc agg	240					
		Val Glu Gly Met Ser Cys Thr Val Ala Gly Glu Gln Met Pro Cys Arg						
10		65		70		75		80
		ctt ccg aaa ttt caa gag aac ttc aag ttc aga gac tac gtc tct ccg	288					
		Leu Pro Lys Phe Gln Glu Asn Phe Lys Phe Arg Asp Tyr Val Ser Pro						
		85		90		95		
		aaa gac aaa aac gaa gtc ggg atg aaa gct ttc gtc aga gat ctg aaa	336					
15		Lys Asp Lys Asn Glu Val Gly Met Lys Ala Phe Val Arg Asp Leu Lys						
		100		105		110		
		gaa gaa ttc tcc acc gtt gat tac atc tac gtc tgg cac gcg ctt tgc	384					
		Glu Glu Phe Ser Thr Val Asp Tyr Ile Tyr Val Trp His Ala Leu Cys						
		115		120		125		
20		ggy tac tgg gdw ggt ctt cgt ccc gga gct cct act ctt ccg ccs tcr	432					
		Gly Tyr Trp Gly Gly Leu Arg Pro Gly Ala Pro Thr Leu Pro Pro Ser						
		130		135		140		
		act att gtc cgr cca gag ctc tcg ccg ggg ctt aag ttg acg atg caa	480					
		Thr Ile Val Arg Pro Glu Leu Ser Pro Gly Leu Lys Leu Thr Met Gln						
25		145		150		155		160
		gat ctc gcc gtt gat aag atc atc gat acc gga atc gga ttc gtc tcg	528					
		Asp Leu Ala Val Asp Lys Ile Ile Asp Thr Gly Ile Gly Phe Val Ser						
		165		170		175		
		ccg gac atg gcg aac gag ttt tac gaa ggt ctt cac tct cat ctt caa	576					
30		Pro Asp Met Ala Asn Glu Phe Tyr Glu Gly Leu His Ser His Leu Gln						
		180		185		190		
		aac gtc ggc att aac ggc gtt aaa gtt gac gtt atc cac ata ctg gag	624					
		Asn Val Gly Ile Asn Gly Val Lys Val Asp Val Ile His Ile Leu Glu						
		195		200		205		
35		atg ttg tgc gag aaa tat ggc ggg aga gtt gac ttg gct aaa gct tac	672					
		Met Leu Cys Glu Lys Tyr Gly Gly Arg Val Asp Leu Ala Lys Ala Tyr						
		210		215		220		
		ttc aag gcg tta acg tcg tca gtg aat aag cat ttt gac ggc aac gcc	720					
		Phe Lys Ala Leu Thr Ser Ser Val Asn Lys His Phe Asp Gly Asn Ala						
40		225		230		235		240

	gtt atc gcc agc atg gag cac tgt aat gac ttc atg ttc ctt gga acc	768
	Val Ile Ala Ser Met Glu His Cys Asn Asp Phe Met Phe Leu Gly Thr	
	245 250 255	
5	gaa gcc atc tct cta ggt cgt gtc ggt gat gac ttt tgg tgc acg gat	816
	Glu Ala Ile Ser Leu Gly Arg Val Gly Asp Asp Phe Trp Cys Thr Asp	
	260 265 270	
	cca tct ggc gac att aac ggc acg tat tgg ctg caa gga tgt cac atg	864
	Pro Ser Gly Asp Ile Asn Gly Thr Tyr Trp Leu Gln Gly Cys His Met	
	275 280 285	
10	gtc cac tgt gcc tac aac agt ctt tgg atg gga aat ttc atc cag cct	912
	Val His Cys Ala Tyr Asn Ser Leu Trp Met Gly Asn Phe Ile Gln Pro	
	290 295 300	
	gat tgg gac atg ttt cag tcc aca cat cct tgt gct gag ttc cat gct	960
	Asp Trp Asp Met Phe Gln Ser Thr His Pro Cys Ala Glu Phe His Ala	
15	305 310 315 320	
	gct tca cgt gcc atc tcc ggt ggg ccc att tac atc agc gat tgt gtg	1008
	Ala Ser Arg Ala Ile Ser Gly Gly Pro Ile Tyr Ile Ser Asp Cys Val	
	325 330 335	
	ggc cag cac gat ttc gat ctc ttg agg aga ctc gtt ttg cct gac ggt	1056
20	Gly Gln His Asp Phe Asp Leu Leu Arg Arg Leu Val Leu Pro Asp Gly	
	340 345 350	
	tcg att ttg agg tgt gag tac tat gct ctc cca act cgt gac cgt ctc	1104
	Ser Ile Leu Arg Cys Glu Tyr Tyr Ala Leu Pro Thr Arg Asp Arg Leu	
	355 360 365	
25	ttt gaa gac cct ctt cat gat ggc aaa acc atg ctc aag att tgg aac	1152
	Phe Glu Asp Pro Leu His Asp Gly Lys Thr Met Leu Lys Ile Trp Asn	
	370 375 380	
	ttg aac aag tac act gga atc atc gga gca ttc aac tgt caa gga gga	1200
	Leu Asn Lys Tyr Thr Gly Ile Ile Gly Ala Phe Asn Cys Gln Gly Gly	
30	385 390 395 400	
	gga tgg tgc aga gaa act cga cgc gac caa tgc ttc tcc caa tgc gtt	1248
	Gly Trp Cys Arg Glu Thr Arg Arg Asp Gln Cys Phe Ser Gln Cys Val	
	405 410 415	
	aac acg tta acc gcc aca aca aat cct aat gac gtt gaa tgg aac agt	1296
35	Asn Thr Leu Thr Ala Thr Thr Asn Pro Asn Asp Val Glu Trp Asn Ser	
	420 425 430	
	ggg aac aac ccg atc tcc att gaa aac gtt gaa gag ttt gct ttg ttc	1344
	Gly Asn Asn Pro Ile Ser Ile Glu Asn Val Glu Glu Phe Ala Leu Phe	
	435 440 445	
40	ttg tct caa tcc aag aag ctt gtg ttg tcc ggg caa aac gat gat ctc	1392

	Leu Ser Gln Ser Lys Lys Leu Val Leu Ser Gly Gln Asn Asp Asp Leu	
	450 455 460	
	gag atc aca tta gag ccc ttc aag ttc gag ctc atc act gtc tca cca	1440
	Glu Ile Thr Leu Glu Pro Phe Lys Phe Glu Leu Ile Thr Val Ser Pro	
5	465 470 475 480	
	gtt gtc acc att gag ggc agt tcg gtt cag ttt gct cca atc gga ttg	1488
	Val Val Thr Ile Glu Gly Ser Ser Val Gln Phe Ala Pro Ile Gly Leu	
	485 490 495	
	gtt aac atg ctt aac act agc ggt gcg att cga tcc ttg gtt tat cat	1536
10	Val Asn Met Leu Asn Thr Ser Gly Ala Ile Arg Ser Leu Val Tyr His	
	500 505 510	
	gag gaa tcc gtt gag atc ggt gtt cgt ggt gct gga gaa ttc agg gtt	1584
	Glu Glu Ser Val Glu Ile Gly Val Arg Gly Ala Gly Glu Phe Arg Val	
	515 520 525	
15	tat gca tcg aag aaa cct gtg agc tgc aag att gat ggt gaa gat gtt	1632
	Tyr Ala Ser Lys Lys Pro Val Ser Cys Lys Ile Asp Gly Glu Asp Val	
	530 535 540	
	gag ttt ggg tac gaa gag tca atg gtg atg gtt caa gtg cct tgg tct	1680
	Glu Phe Gly Tyr Glu Glu Ser Met Val Met Val Gln Val Pro Trp Ser	
20	545 550 555 560	
	gca cca gag ggt ttg tct tct att aag tat ttg ttt tag agttatttaa	1729
	Ala Pro Glu Gly Leu Ser Ser Ile Lys Tyr Leu Phe	
	565 570	
	ggtgcttaat tgaaaaaaaa aaaaaaaaaa aaa	1762
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	<210> 9	
	<211> 25	
	<212> DNA	
	<213> Artificial Sequence	
30		
	<220>	
	<223> Designed oligonucleotide primer to obtain raffinose synthase gene.	
	<400> 9	
35	ccaatctgat catgcttgtg ccgaa	25
	<210> 10	
	<211> 30	
	<212> DNA	
40	<213> Artificial Sequence	

$\langle 220 \rangle$

⟨223⟩ Designed oligonucleotide primer to obtain raffinose synthase gene.

5 $\langle 400 \rangle$ 10

ggaacaaagt tatgcactat tatttaaggt 30

<210> 11

<211> 27

10 <212> DNA

<213> Artificial Sequence

<220>

<223> Designed oligonucleotide primer to obtain raffinose synthase gene.

15

<400> 11

ctaccaaatt ccacaactta aagttca 27

<210> 12

20 $\langle 211 \rangle$ 32

<212> DNA

⟨213⟩ Artificial Sequence

 $\langle 220 \rangle$

25 <223> Designed oligonucleotide primer to obtain raffinose synthase gene.

<400> 12

ggaataataa gcttcacaca tactgtactc tc 32

30 $\langle 210 \rangle$ 13

<211> 30

<212> DNA

⟨213⟩ Artificial Sequence

35 $\langle 220 \rangle$

<223> Designed oligonucleotide primer to obtain raffinose synthase gene.

<400> 13

atggctccaa gctttagcaa ggaaaattcc 30

40

<210> 14
<211> 30
<212> DNA
<213> Artificial Sequence
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<220>
<223> Designed oligonucleotide primer to obtain raffinose synthase gene.

<400> 14
10 tcaaaataag tactcaacag tggtaaaacc 30

<210> 15
<211> 30
<212> DNA
15 <213> Artificial Sequence

<220>
<223> Designed oligonucleotide primer to obtain raffinose synthase gene.

20 <400> 15
ttggaagaga agacccgcc gggaatcgtc 30

<210> 16
<211> 30
25 <212> DNA
<213> Artificial Sequence

<220>
<223> Designed oligonucleotide primer to obtain raffinose synthase gene.
30

<400> 16
ttaagccccg gcgagagctc tggccggaca 30

<210> 17
35 <211> 30
<212> DNA
<213> Artificial Sequence

<220>
40 <223> Designed oligonucleotide primer to obtain raffinose synthase gene.

	<400> 17	
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5	<210> 18	
	<211> 25	
	<212> DNA	
	<213> Artificial Sequence	
10	<220>	
	<223> Designed oligonucleotide primer to obtain raffinose synthase gene.	
	<400> 18	
	aaataatagg ggcagtacaa attacaccac	30
15	<210> 19	
	<211> 29	
	<212> DNA	
	<213> Artificial Sequence	
20	<220>	
	<223> Designed oligonucleotide primer to obtain raffinose synthase gene.	
	<400> 19	
25	atggctccac cgagcgtaat taaatccga	29
	<210> 20	
	<211> 30	
	<212> DNA	
30	<213> Artificial Sequence	
	<220>	
	<223> Designed oligonucleotide primer to obtain raffinose synthase gene.	
35	<400> 20	
	ctaaaactca tacttaatag aagacaaacc	30
	<210> 21	
	<211> 41	
40	<212> DNA	

<213> Artificial Sequence

 $\langle 220 \rangle$

5 <223> Designed oligonucleotide primer to obtain raffinose synthase gene,
n is i.

<400> 21

cgatggatgg gnaanttnat ncancngan tggganatgt t 41

10 $\langle 210 \rangle$ 22

<211> 32

<212> DNA

<213> Artificial Sequence

15 $\langle 220 \rangle$

<223> Designed oligonucleotide primer to obtain raffinose synthase gene,
n is i, r is a or g.

<400> 22

20 ggccacatnt tnacnarncc natnggngcn aa 32

<210> 23

$\langle 211 \rangle$ 30

<212> DNA

25 <213> Artificial Sequence

<220>

<223> Designed oligonucleotide primer to obtain raffinose synthase gene.

30 <400> 23

tggttactagg cgaaacaaga gtagctctga 30

<210> 24

<211> 47

35 <212> DNA

<213> Artificial Sequence

 $\langle 220 \rangle$

40 <223> Designed oligonucleotide primer to obtain raffinose synthase gene,
 n is i.

	<400> 24	
	cgaggnggnt gncncncngg nttngtnatn atngangang gntggca	47
5	<210> 25	
	<211> 29	
	<212> DNA	
	<213> Artificial Sequence	
10	<220>	
	<223> Designed oligonucleotide primer to obtain raffinose synthase gene, n is i, y is t or c, r is a or g.	
	<400> 25	
15	atyttrtcna cngcnarrtc ytccatngt	29
	<210> 26	
	<211> 38	
	<212> DNA	
20	<213> Artificial Sequence	
	<220>	
	<223> Designed oligonucleotide primer to obtain raffinose synthase gene, n is i, y is t or c.	
25	<400> 26	
	ggnacntant ggytncangg ntgncanatg gtncantg	38
	<210> 27	
30	<211> 32	
	<212> DNA	
	<213> Artificial Sequence	
	<220>	
35	<223> Designed oligonucleotide primer to obtain raffinose synthase gene, n is i, r is a or g.	
	<400> 27	
	ggccacatnt tnacnarncc natnggngcn aa	32
40		

<210> 28
<211> 26
<212> DNA
<213> Artificial Sequence
5
<220>
<223> Designed oligonucleotide primer to obtain raffinose synthase gene.

<400> 28
10 atctatttgt catgacgatg atccga 26

<210> 29
<211> 30
<212> DNA
15 <213> Artificial Sequence

<220>
<223> Designed oligonucleotide primer to obtain raffinose synthase gene.

20 <400> 29
ggccctcatt cccatattgg gatgacctc 30

<210> 30
<211> 30
25 <212> DNA
<213> Artificial Sequence

<220>
<223> Designed oligonucleotide primer to obtain raffinose synthase gene.
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<400> 30

aagcatgcc aacatacaca tgctcaacag 30

35 <210> 31
<211> 30
<212> DNA
<213> Artificial Sequence

40 <220>

<223> Designed oligonucleotide primer to obtain raffinose synthase gene.

<400> 31
agacccgggg aaagctttgg ggttactact 30

5

<210> 32
<211> 28
<212> DNA
<213> Artificial Sequence

10

<220>
<223> Designed oligonucleotide primer to obtain raffinose synthase gene.

<400> 32
15 tggatgggaa actttataca ccctgact 28

<210> 33
<211> 28
<212> DNA
20 <213> Artificial Sequence

<220>
<223> Designed oligonucleotide primer to obtain raffinose synthase gene.

25 <400> 33
gacatgttcc catctacaca cccttgatg 28

<210> 34
<211> 30
30 <212> DNA
<213> Artificial Sequence

<220>
<223> Designed oligonucleotide primer to obtain raffinose synthase gene.

35 <400> 34
ccaatttatg ttagtgatgt tgttggcaag 30

<210> 35
40 <211> 26

<212> DNA
<213> Artificial Sequence

<220>
5 <223> Designed oligonucleotide primer to obtain raffinose synthase gene.

<400> 35
tcgactccca gggtagaatt gtcac 26

10 <210> 36
<211> 35
<212> DNA
<213> Artificial Sequence

15 <220>
<223> Designed oligonucleotide primer to obtain raffinose synthase gene,
n is i.

<400> 36
20 cgattnaang tntggtggac nacncantgg gtngg 35

<210> 37
<211> 38
<212> DNA
25 <213> Artificial Sequence

<220>
<223> Designed oligonucleotide primer to obtain raffinose synthase gene,
n is i, r is a or g.

30 <400> 37
cantgnacca tntgncancc ntgnarccan tangtncc 38

<210> 38
35 <211> 30
<212> DNA
<213> Artificial Sequence

<220>
40 <223> Designed oligonucleotide primer to obtain raffinose synthase gene.

	<400> 38	
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5	<210> 39	
	<211> 26	
	<212> DNA	
	<213> Artificial Sequence	
10	<220>	
	<223> Designed oligonucleotide primer to obtain raffinose synthase gene.	
	<400> 39	
	caacggcgag atcttgcac gtcaac	26
15	<210> 40	
	<211> 30	
	<212> DNA	
	<213> Artificial Sequence	
20	<220>	
	<223> Designed oligonucleotide primer to obtain raffinose synthase gene.	
	<400> 40	
25	ggattcgaca caaaccgcca cgtcatcgtc	30
	<210> 41	
	<211> 27	
	<212> DNA	
30	<213> Artificial Sequence	
	<220>	
	<223> Designed oligonucleotide primer to obtain raffinose synthase gene.	
35	<400> 41	
	ccacgtgcac caccogaact tatcgac	27
	<210> 42	
	<211> 30	
40	<212> DNA	

<213> Artificial Sequence

<220>

<223> Designed oligonucleotide primer to obtain raffinose synthase gene.

5

<400> 42

aacatcgata ccatcggagt catgtccaat 30

<210> 43

10 <211> 30

<212> DNA

<213> Artificial Sequence

<220>

15 <223> Designed oligonucleotide primer to obtain raffinose synthase gene.

<400> 43

gttagggttc atatgaacac cttcaagctc 30

20 <210> 44

<211> 29

<212> DNA

<213> Artificial Sequence

25 <220>

<223> Designed oligonucleotide primer to obtain raffinose synthase gene.

<400> 44

30 tctacgtctg gcacgcgctt tgcggctac 29

<210> 45

<211> 31

<212> DNA

<213> Artificial Sequence

35 <220>

<223> Designed oligonucleotide primer to obtain raffinose synthase gene.

<400> 45

40 gttgacgtca tccacatatt ggagatgttg t 31

<210> 46
<211> 29
<212> DNA
5 <213> Artificial Sequence

<220>
<223> Designed oligonucleotide primer to obtain raffinose synthase gene.

10 <400> 46
gttatcgcta gcatggagca ctgtaatga 29

<210> 47
<211> 35
15 <212> DNA
<213> Artificial Sequence

<220>
<223> Designed oligonucleotide primer to obtain raffinose synthase gene.

20 <400> 47
aacgagctca atccaaaatc tcatcaaata atcgc 35

<210> 48
25 <211> 25
<212> DNA
<213> Artificial Sequence

<220>
30 <223> Designed oligonucleotide primer to obtain raffinose synthase gene.

<400> 248
acaatagttg agggcggaag agtag 25

35 <210> 49
<211> 25
<212> DNA
<213> Artificial Sequence

40 <220>

<223> Designed oligonucleotide linker to obtain raffinose synthase gene.

<400> 49
gatcgagctc gtgtcggatc cagct 25

5

<210> 50
<211> 17
<212> DNA
<213> Artificial Sequence

10

<220>
<223> Designed oligonucleotide linker to obtain raffinose synthase gene.

<400> 50
15 ggatccgaca cgagctc 17

<210> 51
<211> 30
<212> DNA
20 <213> Artificial Sequence

<220>
<223> Designed oligonucleotide primer to confirm direction of the inserted
raffinose synthase gene.

25

<400> 51
cctcctcgga ttccattgcc cagctatctg 30

<210> 52
30 <211> 30
<212> DNA
<213> Artificial Sequence

<220>
35 <223> Designed oligonucleotide primer to confirm direction of the inserted
raffinose synthase gene.

<400> 52
ggattcgaca caaaccgcca cgtcatcgtc 30

40

<210> 53

<211> 29

<212> DNA

<213> Artificial Sequence

5

<220>

<223> Designed oligonucleotide primer to confirm direction of the inserted
raffinose synthase gene.

10

<400> 53

tctacgtctg gcacgcgctt tgcggctac

29